



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. Serial No.: 09/373,272

Group Art Unit: 1635

Filing Date: 08/12/1999

Examiner: Epps, Janet

Applicant(s): Austin-Phillips et al.

Attorney Docket No.: 09820.114

Title: Transgenic Plants as an Alternative Source of Lignocellulosic-Degrading Enzymes

DECLARATION UNDER RULE 131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

To the Commissioner:

Your Declarants, Sandra Austin-Phillips, Richard R. Burgess, Thomas L. German, and Thomas Ziegelhoffer, do hereby declare and state as follows:

1. We are each co-inventors of Claims 27, 28, and 31-40 of the above-identified patent application and co-inventors of the subject matter described and claimed therein.
2. The above-identified application for patent was filed on August 12, 1999, and is a continuation-in-part of parent application Serial No. 08/883,495, filed June 26, 1997 (and issued as U.S. Patent No. 5,981,835). A true and complete copy of the parent application as filed (S.N. 08/883,495) is attached hereto as Exhibit A, and is incorporated herein.

3. We collectively submit that the subject matter of Claims 27, 28, and 31-40 of the above-identified patent application are enabled by the parent application attached hereto as Exhibit A. Specifically, please see pages 6 and 7 and Figs. 1-5 of Exhibit A. Fig. 1 of Exhibit A is a schematic diagram of a gene construct to express the E2 cellulase of *T. fusca* in plants. Similarly, Fig. 2 of Exhibit A is a schematic diagram of a gene construct to express the E3 cellulase of *T. fusca* in plants. Fig. 3 of Exhibit A is a western blot evidencing that the present inventors had expressed *T. fusca* E2 cellulase in tobacco. Fig. 4 of Exhibit A is a western blot evidencing that the present inventors had expressed *T. fusca* E3 cellulase in tobacco. Fig. 5 of Exhibit A is a western blot evidencing that the present inventors had expressed *T. fusca* E2 cellulase in alfalfa. See also Examples 1, 2, and 3 of Exhibit A, at page 22, line 20, to page 25, line 26. These examples describe the expression of *T. fusca* cellulases E2 and E3 in alfalfa and in tobacco. Lastly, see Example 4, beginning at page 26, line 1 of Exhibit A, which describes using the transgenic plants in silage. Thus, we respectfully submit that all of present Claims 27, 28, and 31-40 are entitled to priority to the June 26, 1997 filing date of the parent application.
4. Prior to September 12, 1996, we had conceived of and reduced to practice the invention described and claimed in the present application as evidenced by Exhibits B attached hereto and incorporated herein. All of the dates redacted from Exhibits B-X are prior to September 12, 1996.
5. Attached hereto as Exhibit B is an excerpt from my, Thomas Ziegelhoffer's, laboratory notebooks. I personally signed and dated the notebook pages contained in Exhibit B, contemporaneously with the performance of the experiments detailed in Exhibit B. All of the dates redacted from Exhibit B are prior to September 12, 1996. I, Thomas Ziegelhoffer, declare that the lab

notebook pages shown in Exhibit B detail the construction of expression vectors containing the E2 and E3 genes from *T. fusca*. The first seven (7) pages of Exhibit B document my successful efforts to clone the E2 and E3 cellulase genes of *T. fusca* and to insert the cloned genes into a suitable construct for transforming a plant host. Specifically, at the first page of Exhibit B, I, Thomas Ziegelhoffer, titled the experiment "Expression of cellulases in plants...." I then recorded the rational for the subsequent experiments as follows: "For an initial set of constructs, fuse E2 and E3 genes of *Thermospora fusca* to MAC promoter and NOS terminator in PCGN1578 constructs...." Sheets 6-13 of Exhibit B show that tobacco plants transformed with the vectors described earlier in Exhibit B did express the E2 and E3 genes as shown by Western blot.

6. Attached hereto as Exhibit C is true copy of a cover letter authored by Cheryl E. Gest of the University of Wisconsin and an attached grant application entitled "Transgenic Alfalfa as an Alternative Economical Source of Lignocellulosic Degrading Enzyme for Use in Biomass Conversion." Exhibit C is incorporated herein. We, the Declarants Sandra Austin-Phillips, Richard R. Burgess, and Thomas L. German, authored the grant proposal presented in Exhibit C. In Exhibit C, page 1, Section 2, paragraph A, it is noted that the goal of the research is to construct plant expression vectors coding for cellulases. Further, Exhibit C indicates that an alternative source for cloned *T. fusca* E2 and E3 had been secured (courtesy of Dr. P. Wilson at Cornell University). Also note that paragraphs 2A *et seq.* of Exhibit C detail a strategy for constructing the expression vectors that are currently claimed in the present application.

7. We, Sandra Austin-Phillips, Richard R. Burgess, Thomas L. German, and Thomas Ziegelhoffer (individually and collectively), do hereby declare that all statements made herein of our own knowledge (individual and collective) are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: October 15, 2003

Sandra Austin-Phillips
Sandra Austin-Phillips

Date: _____

Richard R. Burgess

Date: _____

Thomas L. German

Date: October 15, 2003

Thomas Ziegelhoffer
Thomas Ziegelhoffer

7. We, Sandra Austin-Phillips, Richard R. Burgess, Thomas L. German, and Thomas Ziegelhoffer (individually and collectively), do hereby declare that all statements made herein of our own knowledge (individual and collective) are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: _____

Sandra Austin-Phillips

Date: _____

Richard R. Burgess

Date: 10/15/03

Thomas L. German
Thomas L. German

Date: _____

Thomas Ziegelhoffer

7. We, Sandra Austin-Phillips, Richard R. Burgess, Thomas L. German, and Thomas Ziegelhoffer (individually and collectively), do hereby declare that all statements made herein of our own knowledge (individual and collective) are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: _____

Date: Oct 16, 2003

Date: _____

Date: _____

Sandra Austin-Phillips


Richard R. Burgess

Thomas L. German

Thomas Ziegelhoffer